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ABSTRACT

Twenty college age males' hand shrugs, face-play manipulations, and frequency and duration of mutual eye ccntact were recorded in response to a female counterpart whc varied her assertiveness and attractiveness in a two by two factorial design. Mutual eye contact, which increased under attractive conditions, was a useful negative correlate of anxiety because the more anxious individuals, both generally and contextually, decreased the frequency and duratien of their mutual eye contact. The hand shrug emblems and the face-play adapters, however, were nct useful indicators of anxiety because they did not reflect significant change under conditions of situational anxiety. The implicatiens of these results on correlates of anxiety contradict some previous research and indicate a need for future research on both male and female subjects. (MAI)

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NONVERBAL CORRELATES OF ANXIETY

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Nonverbal Correlates of Anxiety

What nonverbal cues are emitted when a person is experiencing anxiety? Ekman and Friesen (1969b) developed a useful taxonomy for discriminating amongst various nonverbal acts. Three are particularly relevant for this paper. An emblem is a nonverbal act which has a direct verbal translation with which most of a culture or subculture agrees such as the gestures used to represent "A-OK or "peace." Adapters are habital nonverbal acts which are used to satisfy bodily or social needs. In isolation they often occur intact, but, since they are often considered unacceptable, are quickly fragmented in public, often beyond recognition. Many a nose pick has become a mere rub of the nose upon the awareness that others are watching. Many adapters have been considered indications of anxiety. Regulators are nonverbal acts which sustain and limit the flow of sending and receiving communications between interactants. The head nod is a familiar regulator.

The present study used the hand shrug emblem (helplessness or inability), the face-play manipulation adapter and the eye- contact regulator as the dependent variables. These were chosen as indices of anxiety. Two of the measures are hand movements. Ekman and Friesen (1969a) suggested that anxiety, being a negative emotion, is often suppressed and that the hands can be a source of leakage for this anxiety. In a later work, Ekman and Friesen (1972) found the frequency of hand shrug emblems increased ($p < .05$).

in the deceptive conditions. The present investigator hypothesized that hand shrugs will increase under anxiety conditions.

Ekman and Friesen in the same study also examined self and object adapters. Self and object adapters are thought to indicate restlessness or anxiety. While not all self and object adapters in this study supported this assertion, face-play manipulations increased ($p<.01$) in the deceptive conditions. Mehrabian (1971) in a series of experiments also found self-manipulation rates to be higher in high anxiety conditions. A face-play manipulation is any touching movement of the hand to the head and face but not the neck. Actual contact must be made either through the hand and fingers or an extension of the hand (i.e. pencil). Brushing hair out of the eyes, scratching the face or stroking the beard would be examples of face-play manipulations. Face-play manipulations, in the present study, were hypothesized to increase under anxiety conditions.

Eye-contact regulates interaction. The taking of speaking turns is greatly aided by seeing when one person is finished and willing to relinquish the floor. As with any regulation, both positive and negative forces are at work. When a positive relationship or emotion exists between two interactants, eye-contact increases. Exline (1960, 1963) found some support that eye-contact signals a need for affiliation and that individuals who have affiliative needs return more glances. Efran and Broughton (1966) noticed more eye-contact occurred between subjects and others with whom they had just had a friendly conversation. Mehrabian (1968), examining eye-contact and liking, obtained data that both men and women had more eye-contact with liked interactants. Exline and Messick (1967)

suggest dependent individuals use eye-contact to communicate positive attitudes and to elicit such when they are missing.

If, on the other hand, negative forces are present, a reduction in eye-contact is the consequent. Exline and Winters (1965) manipulating an interviewer's evaluative comments, created significant reductions in subject eye-contact after negative comments. Mehrabian (1969) found less eye-contact occurred when subjects interacted with disliked persons. Knapp (1972) claimed avoiding eye-contact made it easier to avoid interaction with that person. He also stated that in competitive situations where there is dislike or tension, the participants may engage in less eye-contact. Assuming anxiety to be unpleasant, the frequency and duration of eye-contact was hypothesized to decrease under anxiety conditions.

Anxiety was created by using an approach-avoidance paradign. A female confederate systematically varied her attractiveness and assertiveness in an interaction with male subjects. In a previous study of female attractiveness and assertiveness, Eckman (1977) found that men became anxious under these conditions.

Method

A 2 X 2 factorial design was employed. The independent variables, attractiveness and assertiveness, each had two levels, high and low. The dependent variables, hand shrugs, face-play manipulations and duration of eye-contact, were measured by two independent judges examining videotapes of the experiment. A female confederate manipulated her attractiveness by careful grooming and wearing becoming clothes one day, and careless grooming and wearing sloppy clothes the next. Assertiveness was varied by having the confederate disagree 3 times and initiate communication 3 times during the assertive condition. The passive condition was created by having the confederate initiate communication only once and never disagreeing with her partner.

Subjects and Procedure

Twenty male undergraduates from the introductory interpersonal course were used. The subjects' mean age was 18.85 years with a range of 17-22. The subjects were randomly assigned to one of the four conditions. A subject was brought into the laboratory followed by the confederate from a separate waiting room. The experimenter introduced the two and asked them to sit down. The confederate always took the same seat. They were given a task to solve, which consisted of pretending they had just been shipwrecked and were to decide together a rank order of importance for a set of six possible survival decisions. The experimenter, after explaining

what was required and answering any questions, retired to another room. After the two people read the instructions, story and alternative decisions, the confederate varied her assertiveness as previously mentioned. Unknown to the subject, the entire interaction was recorded through a one-way mirror so the cameras would not be seen. Each dependent variable could then be analyzed separately and repeatedly with no loss of information from "live" observations (Eisler, Hersen, and Agras, 1973). Once a rank order was derived, the subject was taken to a separate room to fill out a semantic differential and the Taylor Manifest Anxiety Scale. Upon completion, the experimenter explained the experimental procedure to the subjects and obtained permission to use the videotapes.

The videotapes were scored by two independent judges for hand shrugs, face-play manipulations, and frequency and duration of mutual eye-contact. The interjudge reliability was well above the .001 level of significance for the frequency of hand shrugs r=.99, frequency of face-play manipulations r=.99, frequency of eye-contact r=.99, and duration of eye-contact r=.98.

Results

Analyses of variance were done for hand shrugs, face play manipulations, and eye-contact and are summarized in Tables 1-4. Hand shrugs and face play manipulations were not significant, regardless of the level of assertiveness or attractiveness of the female. The frequency of mutual eye-contact was significantly increased ($p<.01$) in the attractive condition but not the assertive condition. The duration of mutual eye-contact was close to significance (strong trend) in the attractive condition, but again, not in the assertive condition. A Neuman-Keuls test of this trend revealed no significant differences between the cells.

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Insert Tables 1-4 here

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In order to examine whether trait anxiety would influence the nonverbal behaviors systematically, Pearson product moment correlations were computed between subjects' Taylor Manifest anxiety scores and their nonverbal behaviors. Table 5 reveals that while there was no systematic relationship between trait anxiety and hand shrugs or face-play manipulations, there were significant negative correlations for the frequency and duration of eye-contact. The individuals high in general anxiety utilize less frequent mutual eye-contact, and when mutual eye-contact does occur, maintain it for shorter durations, than do less anxious individuals.

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Insert Table 5 here

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Whether or not immediate situational factors, which influence an individuals present state of anxiety, will influence the emission pattern of nonverbal acts was examined by correlating the state anxiety scores reported

on the semantic differential with the dependent variables. Table 6 presents the Pearson product moment correlations. Again hand shrugs and face-play manipulations were not influenced by situational anxiety while mutual eye-contact was. Individuals who experienced more anxiety under particular experimental conditions had less frequent mutual eye-contact with the confederate than those people who experienced less anxiety. The durations of these less frequent mutual eye-contacts, while not significant, gave a clear trend in the same negative direction: less duration than the less anxious subjects.

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Insert Table 6 here

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Discussion

In the experimental examination of nonverbal behavior, something is gained and something is lost. Control and the knowledge that what was measured corresponds more closely to what was intended to be measured than other means of gathering data is gained. However, to gain this control and certainty, nonverbal units of behavior must be artificially isolated. Consequently the nonverbal behaviors measured may not be the same as naturally occurring units. It is the hope of this author that while isolation is presently necessary to obtain patterns of when and under what conditions particular behaviors occur, once more reliable information is available, a more integrated multi-channel approach to describing and predicting communication patterns will be utilized.

Hand shrugs and face-play manipulations do not seem to be useful indicators of anxiety. They did not significantly change regardless of the confederate's assertiveness or attractiveness and when correlated with the

subjects' own measure of situational and trait anxiety, were not significant. The hand shrug emblem can not be generalized from deception (Ekman & Freisen, 1972) to anxiety. Likewise, the face-play adapter does not increase under anxiety conditions, while it did in deception.

This is either because there is little in common between the kinesic movements of anxiety and deception or that Ekman and Friesen's (1972) results aren't reliable. Their hypothesis about object and self-adapters was tested with a very small sample and was generally unsupported with the exception of face-play manipulations. Knapp, Hart & Dennis (1974), using a different deception condition, did not replicate Ekman & Friesen's (1972) finding.

Another possible explanation for the lack of adapter results was the briefness of the experimental procedure. Adapters tend to increase with restlessness. The experimental task took approximately 10 minutes. The chance of restlessness or boredom with a brief task is rather minor. This might have artificially reduced the display of adapters.

A further problem that could account for the lack of adapter results is the breadth of the classification of face-play manipulations. Too many meanings for the same act can be categorized as the same thing. A face-play manipulation as scored in the present study would include grooming behavior as well as nervous tics. In the presence of an attractive female, a male will groom because he is attracted to her, will groom because his gender display is being evoked by her gender display, or will groom excessively out of anxiety. Grooming face-play manipulations in each situation will have a different meaning and yet all would have been scored similarly in the present classification system. The category face-play manipulations is too easily confounded to be useful as a cue of anxiety.

Further refinement of the adapter category needs to be done. On the basis of the present study and the limited amount of previous evidence, adapters are concluded to be of limited use as a cue to anxiety because of their fragmented nature, their highly variable meanings, and the user's often lack of awareness.

Mutual eye-contact, on the other hand, does seem to be a good cue of attraction and anxiety, although in different ways. When the confederate was attractive she received more frequent eye-contact and for longer durations. When the subjects' eye-contact was correlated with their own situational and trait anxiety, the frequency and duration of their eye-contact was less, the more anxious they felt. The regulatory function of eye-contact is clearly visible. When a person finds someone attractive he looks at them more, signaling his openness and readiness for interaction. When a person feels anxious, he reduces his eye-contact, signaling a reticence or unwillingness for interaction. This is consistent with previous research.

This conclusion, however, does not support Ekman and Friesen's (1969) conclusion that the hands and feet are better sources of leakage clues than the face. Assume that, in this society, anxiety is a negative emotion and consequently often suppressed. Ekman & Friesen would argue that the hands should be a better source of leakage clues that anxiety is being felt but not expressed (deception). However, the data in this experiment [illegible] the frequency and duration of eye-contact were better clues that anxiety was occurring than hand movements. A partial explanation of this discrepancy with Ekman and Friesen's (1969) results is that they examined facial expressions and not eye-contact behavior. They categorized gross anatomical areas, and then looked for leakage clues. Perhaps, since the

range of facial displays is very wide and the sender is more aware of using his face with each display than his total eye-contact behavior, Ekman and Friesen would be correct if they were to state that the face, meaning facial expression and not eye-contact, is a poorer source of leakage clues than either the hands or feet.

This research should be construed as an exploration of how anxiety is displayed nonverbally. Hand shrugs did not correlate with existing measures of anxiety. It should be regarded as an emblem of uncertainty or helplessness but not anxiety. Face-play manipulations, likewise, are not good cues of anxiety. This category of cue is still inclusive of too many actions with multiple meanings. Future research should, using a larger N than were used in the present study, further refine adapters into even more specific nonverbal acts. The frequency and duration of mutual eye-contact were useful cues to the presence of anxiety. The more anxious the person was, the less frequent he would look at the other person and when he did, it was for shorter durations. Future work should include a male confederate and both male and female subjects to see if female non-verbal reactions to anxiety are similar, and if same sex versus opposite sex interactions create any meaningful nonverbal differences.

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Table 1

Analysis of Variance of the Frequency of Hand Shrugs during Assertiveness and Attractiveness Conditions

Source of Variation	SS	df	MS	F
Assertiveness	15.31	1	15.31	.14
Attractiveness	63.01	1	63.01	.59
Interaction	99.01	1	99.01	.93
Within	1707.4	16	106.71	

Table 2

Analysis of Variance of the Frequency of Face-Play Manipulations during Assertiveness and Attractiveness Conditions

Source of Variation	SS	df	MS	F
Assertiveness	.2	1	.2	.014
Attractiveness	1.25	1	1.25	.09
Interaction	1.25	1	1.25	.09
Within	224.6	16	14.04	

Table 3

Analysis of Variance of the Frequency of Eye-Contact during Assertiveness and Attractiveness Conditions

Source of Variation	SS	df	MS	F
Assertiveness	174.05	1	174.05	10.7*
Attractiveness	470.45	1	470.45	3.96
Interaction	76.05	1	76.05	1.73
Within	703.2	16	43.95	

* $p < .01$

Table 4

Analysis of Variance of the Duration of Mutual Eye-Contact during Attractive and Assertive Conditions

Source of Variation	Sum of Squares	df	MS	F
Row (Assertiveness)	704.37	1	704.37	2.61
Column (Attractiveness)	1210.41	1	1210.41	4.48*
RXC (Interaction)	208.98	1	208.98	.77
Within	4322.79	16	270.17	

*$F_{crit\ .05}$ = 4.49 very strong trend

Table 5

Nonverbal Correlates of Trait Anxiety

Hand Shrugs	r= -.004
Face-play Manipulations	r= -.12
Frequency of Mutual Eye-Contact	r= -.44*
Duration of Mutual Eye-Contact	r= -.50**

* $p < .05$

** $p < .02$

Table 6

Nonverbal Correlates of State Anxiety

Hand Shrugs	r= -.07
Face-play Manipulations	r= .03
Frequency of Mutual Eye-Contact	r= -.43*
Duration of Mutual Eye-Contact	r= -.35

* p< .05